

Scott Levine Outline:

Muscle Testing and Exercise Prescription

Course Description

Muscle Testing and Exercise Prescription is a 9hour series taught by Dr. Levine designed to teach the practitioner how to perform and understand proper muscle testing for the many muscles of the body. In this course Dr. Levine performs muscle tests for the neck, trunk, back, and upper and lower extremities, along with teaching the significance, purpose, anatomy and physiology that are related to these tests. Dr. Levine also teaches the practitioner how to properly develop an appropriate and specific treatment program designed to address fundamental functional abnormalities discovered through muscle testing.

Hour 1- Muscle Testing the Lower Extremity 1

This course will cover:

How to adequately test the strength and function of the various muscles of the lower extremity including: Gluteus medius and minimus, Psoas, Tensor fascia latae, gracilis, pectineus, adductor brevis and magnus, tibialis anterior and posterior, paroneal brevis, longus and tertius, extensor hallucis longus and brevis, flexor hallucis longus and brevis. Dr. Scott Levine demonstrates how to perform and interpret functional tests for these muscles. This enables the practitioner to uncover pathologies and/or faulty biomechanics that often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities that can lead or have lead to pathology of the lower extremity. He or she will better understand biomechanics of the lower extremity through muscle testing allowing the practitioner to more effectively treat complaints in this area. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to more effective treatment and achievement of long-term goals.

Hour 1 Outline:

• Hip abduction- Gluteus medius and minimus.

- o Patient supine- Contact above the ankle, abduct straight-leg, stabilize, and resist adduction.

- o Patient on side (stacked pelvis)- Abduct straight-leg, resist adduction. If the weaker side becomes stronger, this is indicative of pelvic involvement.

• Hip Flexion- Psoas Muscle.

- o Patient supine with hip in slight external rotation. Have patient flex a straight-leg, stabilize, and resist.

- o Perform again while anchoring opposite hip to determine if there is an instability in the lumbar spine.

- o Patient seated with knee raised and hip externally rotated slightly while resisting extension.
- o Weakness that appears or is worsened with sitting indicates possible disc or facet joint involvement.
- **Hip Adduction-** Short (gracilis, pectineus, and adductor brevis) and long (adductor magnus) adductors. Require 2 separate tests.
 - o Patient supine- (Long Adductors) Contact above the ankle, stabilize opposite leg, straight-legs together, and resist abduction. (Short Adductors) Repeat with slight internal rotation of the hip so that the toes are on top of each other. (testing top toes)
- **Big Toe Plantar Flexors-** Extensor hallucis longus (distal joint) and brevis (proximal joint).
 - o Patient prone- Extend big toe, resist distal joint flexion (longus), resist proximal joint flexion (brevis), stabilize below the joint being tested.
- **Big Toe Dorsi Flexors-** Flexor hallucis longus (distal joint) and brevis (proximal joint).
 - o Patient prone- Flex big toe, resist distal joint extension (longus), resist proximal joint extension (brevis), stabilize below the joint being tested.

Hour 2- Muscle Testing the Lower Extremity 2

This course will cover:

How to adequately test the strength and function of the various muscles of the lower extremity including: Rectus femoris, quadriceps, sartorius, piriformis, gluteus maximus, medial and lateral hamstrings, popliteus, gastrocnemius, soleus. Dr. Scott Levine demonstrates how to perform and interpret functional tests for these muscles. This enables the practitioner to uncover pathologies and/or faulty biomechanics that often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities that can lead or have lead to pathology of the lower extremity. He or she will better understand biomechanics of the lower extremity through muscle testing allowing the practitioner to more effectively treat complaints in this area. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to more effective treatment and achievement of long-term goals.

Hour 2 Outline:

- **Hip Flexion-** Rectus Femoris
 - o Patient supine, stand beside the hip- Contact the bent knee, have the patient bend the hip and knee to ninety degrees and resist hip extension. Check bilaterally for weakness or cheating (ankle dorsiflexion).
- **Knee Extension-** Quadriceps
 - o Vastus Medialis- Patient supine with feet together and knee in slight flexion, contact the flexed knee and the ankle while attempting to separate the ankles, have the patient resist in various stages of knee flexion.

- o Vastus Lateralis- Patient supine with knees bent, contact the flexed knee (leg not tested) by reaching under the opposite knee and the ankle (leg tested) while attempting to bend the flexed knee being tested, have the patient resist knee flexion.
- **Lateral Hip Rotation-** Piriformis (Quadratus Femoris, Obturator Internus and Externus)
 - o Patient prone with knee bent to ninety degrees and hip externally rotated, contact ankle while stabilizing pelvis, have the patient resist internal hip rotation bilaterally.
- **Hip Extension-** Gluteus Maximus
 - o Patient prone with knee bent past (less than) ninety degrees and hip extended off the bench, contact hamstring while stabilizing lower back, have the patient resist hip flexion bilaterally. Check lumbar spine stability by stabilizing at the mid-back which will evaluate the opposite side lumbar musculature.
- **Knee Flexion-** Medial and Lateral Hamstring
 - o Medial Hamstring- Patient prone with knee bent to sixty degrees and rotated internally, stabilize the pelvis while contacting the heel, have the patient resist knee extension. Be gentle in order to avoid straining the hamstring.
- **Knee Rotation-** Popliteus (allows the knee to lock and unlock)
 - o Patient prone with knee bent to ninety degrees and rotated internally (toes pointed towards opposite leg), contact the heel and ankle (tibia), have the patient resist foot/ knee rotation (toes out).
 - o Treatment should focus on strengthening. With the patient seated with knees bent, have them stabilize one foot flat on the ground while pressing (isometric) the toes of the opposite foot against the stable foot. For increased resistance add a thera-band around the toes.
- **Plantar Ankle Flexion-** Gastrocnemius and Soleus
 - o Gastrocnemius- Patient supine with knee bent to ninety degrees, contact (grip) the heel so that the patient's foot is pressing against your forearm, dorsi-flex the ankle while the patient attempts to plantar-flex the ankle, resist plantar-flexion.
 - o Soleus- Patient Supine with leg straight, contact (grip) the heel so that the patient's foot is pressing against your forearm, dorsi-flex the ankle while the patient attempts to plantar-flex the ankle, resist plantar-flexion.

Hour 3- Muscle Testing the Upper Extremity

This course will cover:

How to adequately test the strength and function of the various muscles of the upper extremity including: Upper, middle, and lower trapezius, rhomboids, pectorals, subclavius, serratus anterior, latissimus dorsi, supraspinatus, deltoid, subscapularis, teres major, teres minor, infraspinatus, coracobrachialis, brachioradialis, biceps, triceps, supinators, and pronators. Dr. Scott Levine demonstrates how to perform and interpret functional tests for these muscles. This enables the practitioner to uncover pathologies and/or faulty biomechanics that often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities that can lead or have lead to pathology of the upper extremity. He or she will better understand biomechanics of the upper extremity through muscle testing allowing the practitioner to more effectively treat complaints in this area. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to more effective treatment and achievement of long-term goals.

Hour 3 Outline:

• Muscle Testing the Shoulder

- o Tested while the patient is prone: Lower Trapezius, Middle Trapezius, and Scapula Adductor (Rhomboid)

• Lower Trapezius-

- o Patient is prone with arm abducted over-head, elbow fully extended, and arm internally rotated so that the thumb is facing down, Stabilize the low-back/pelvis and contact the patients wrist, have the patient attempt to raise the arm off the table (up) as you resist, compare bilaterally.

• Pectorals- Tested supine, sitting and standing.

- o Patient is supine with arm outstretched and fully internally rotated (thumb down), stabilize the patients opposite waist or shoulder depending on the direction of the fibers being tested, contact the patients forearm and resist arm adduction (watch for cheating which would involve the bicep), test all fibers of the pectorals in various degrees of arm adduction (hip to shoulder) and compare bilaterally. Finally have the patient rest his/her arms by the side and raise shoulder off the table, contact the shoulder and stabilize the opposite shoulder, have the patient resist scapular retraction, compare bilaterally.

• Scapular Stabilizers- Subclavius (Stabilizes clavicle which allows for the higher degrees of shoulder abduction (above 90 degrees))

- o Patient is sitting, arm fully abducted over-head and internally rotated (thumb facing forward), stabilize the opposite shoulder, contact the forearm, have the patient resist shoulder adduction (watch for cheating which would involve the bicep), compare bilaterally.

• Serratus Anterior- (Scapula Abduction) Is associated with rib complaints.

- o Patient is seated with arm outstretched in front (90 degrees) and arm internally rotated (thumb facing down), stabilize the scapula and contact the wrist, have the patient protract the scapula and resist shoulder extension (have the patient attempt to raise the arm) testing for the scapulas ability to stay protracted as the rotator cuff muscles are stressed, compare bilaterally.

• Upper Trapezius- Shoulder Elevation

- o Seated- Have the patient bend the head to one side and raise the same shoulder, contact the top of the shoulder and the side of the head, carefully have the patient resist as you attempt to draw the shoulder away from the head. (use caution if you perform

this test as it will appear weak if there is injury to the neck)

- **Supraspinatus-** (Shoulder Abduction) Is often injured as a result of dysfunction somewhere
 - o Patient is seated or standing- Stand beside the patient, stabilize the top of the shoulder (traction down), contact the elbow or forearm, have the patient internally rotate (thumb facing in) and slightly abduct the shoulder (15 degrees) and resist adduction, compare bilaterally.
- **Deltoid-** Multiple tests for each head of the deltoid are done while the patient is seated with his/her arm bent at the elbow and abducted to 90 degrees. Stand behind the patient and compare bilaterally.
 - o Middle Deltoid- Stabilize the shoulder, contact the top of the patient's elbow and have the patient resist shoulder adduction.
 - o Anterior Deltoid- Stabilize the shoulder, contact the patient's wrist and have the patient push the shoulder anterior (punching motion) as you resist.
 - o Posterior Deltoid- Stabilize the shoulder, contact the back of the patient's elbow and have the patient extend the shoulder posterior as you resist.
- **Subscapularis-** Shoulder Internal Rotator
 - o While the patient is seated with his/her arm bent at the elbow, abducted roughly 70 degrees and internally rotated, stand behind the patient, stabilize the elbow and contact the palm of the arm being tested, have the patient resist external rotation, compare bilaterally.
- **Infraspinatus-** Shoulder External Rotator
 - o While the patient is seated with his/her arm bent at the elbow, abducted roughly 70 degrees and externally rotated, stand behind the patient, stabilize the elbow and contact the back or the hand of the arm being tested, have the patient resist internal rotation, compare bilaterally.
- **Teres Minor-** Shoulder External Rotator
 - o While the patient is seated with his/her arm at the side, bent at the elbow, and externally rotated slightly, stand behind the patient, stabilize the elbow and contact the back of the hand of the arm being tested, have the patient resist internal rotation, compare bilaterally.
 - o Use caution with patients that are injured or are prone to injury.
- **Biceps-** Short and Long Heads (Patient seated)
 - o Short Head- Flex the arm to 45 degrees, flex the elbow to 90 degrees, stabilize the shoulder, contact the wrist and have the patient resist elbow extension, compare bilaterally.
 - o Long Head- Flex the arm to 90 degrees, flex the elbow to 90 degrees, stabilize the back of the shoulder, contact the bicep and have the patient resist shoulder extension, compare bilaterally.
- **Triceps-** Arm/Elbow Extension (2 tests)

o Head #1- Patient is standing as he/she extends the outstretched arm, stabilize the shoulder, contact the forearm as the patient resists arm flexion, compare bilaterally.

o Head #2- Patient is sitting as he/she flex the elbow to 90 degrees with palm-up, stabilize the shoulder, contact the back of the hand and have the patient resist elbow flexion, compare bilaterally.

Hour 4– Muscle Testing the Trunk

This course will cover:

How to adequately test the strength and function of the various muscles of the thorax including: the diaphragm, quadratus lumborum, pelvic floor, transverse abdominus, rectus abdominus, obliques, and sacrospinalis. Dr. Scott Levine demonstrates how to perform and interpret functional tests for these muscles. This enables the practitioner to uncover pathologies and/or faulty biomechanics that often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities of the trunk that can lead or has lead to pathology. He or she will better understand the biomechanics breathing and the core, allowing for better treatment of various complaints throughout the body. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to better care and achievement of long-term goals.

Hour 4 Outline:

• **The Core:** A weakness in any of the following muscles will result in a weak core. Begin and focus on the weaker side when developing a rehabilitative exercise program.

o Top- Diaphragm

o Side- Quadratus Lumborum (QL)

o Bottom- Pelvic Floor

o Front- Transverse Abdominus, Rectus Abdominus

o Back- Extensors, Bilateral Quadratus Lumborum, Sacrospinalis

o The Principle of Proximal Stability for Distal Mobility (Janda)

• **Back Extensors** - Sacrospinalis

o Prone Position - Patients arms are at his/her side, lift head and chest off the table (extend back) and look backward (extend and rotate head towards the practitioner), stabilize the opposite leg and contact the near shoulder, have the patient resist trunk flexion, compare bilaterally.

• **Trunk Flexors** - Quadratus Lumborum (lateral flexors)

o Supine Position- Patients arms are at his/her side, laterally bend the trunk so that the patients legs are together and are off the side of the table, reach across the table contacting the feet and have the patient resist the straightening out of the trunk.

- **Abdominals-** Trunk flexors

- o Rectus Abdominus and Transverse Abdominus- The patient is sitting with bent knees and crossed arms, have the patient press his/her toes down on the palm of your hand (on the table) in order to “turn off” the hip flexors, contact the crossed arms and attempt to push the patient back into extension as he/she resists.

- **Pelvic Floor-** The diaphragm is difficult to test, but there are a number of indications of a weak diaphragm including:

- o Calf tenderness (squeeze the calves)- Have the patient (with relaxed abdominal muscles) raise abdominal organs using the fingertips of both hands. If the calf tenderness goes away then there is an indication of weakness of the diaphragm.

- o To demonstrate proper diaphragmatic breathing, have the patient lie supine with one hand on his/her chest and the other on the abdomen. The abdomen should rise instead of the chest or shoulders (accessory muscles). 10 breaths 5 times per day is a good exercise to promote awareness for patients who breathe without the proper utilization of the diaphragm.

Hour 5– Conditions 1

This course will cover:

How to use and interpret muscle testing and gait analysis in order to better diagnose and treat various musculoskeletal conditions. Dr. Scott Levine demonstrates how to perform and interpret functional tests that enable the practitioner to uncover pathologies and/or faulty biomechanics that often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities of gait and posture that can lead or has lead to pathology. He or she will better understand the biomechanics of gait and the various postures added to muscle tests allowing for better diagnoses and treatment of many common complaints throughout the body. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to better care and achievement of long-term goals.

Hour 5 Outline:

- **Gait-** A persons gait will often reveal recent or older pathology that manifests by causing poor biomechanics. If the problem that initially caused the poor biomechanics or gait is not found and corrected, then treatment of the other secondary conditions will not be as effective.

- **Treatments for poor gait-**

- o May include adjustments to the foot, ankle, knee, hip, or lower back and pelvis. They should also include supportive taping or belts, and in some cases orthotics or better shoes are required.

o In some cases where dysfunction shows only when the person is in the middle of a run or game it may be prudent to have the patient run before performing the muscle test to better show the dysfunction in question.

• **Instability in the Lower Extremity-** Tibia-Fibula instability will present with poor gait and tenderness of the tibialis posterior.

o To test for tibia-fibula instability, stabilize below the knee with one hand and if the tenderness goes away this indicates instability.

o Tibia-fibula instability may cause foot or ankle weakness leading to a faulty gait pattern.

• **Posture-** It is often important to perform muscle tests in specific postures where the patient typically experiences pain. (cyclists, hair stylists, etc.) This will often reveal dysfunction that is not present in the typical positions that muscle tests are performed.

• **Muscle, disc, or facet joint?** (Various postures)

o Psoas muscle involvement will often show up while testing the patient supine or sitting.

o If the test is only positive or is even weaker while sitting with lower back extension, this may indicate facet joint involvement.

o If the test is only positive or is even weaker while sitting with lower back flexion, this may indicate disc involvement.

• **Use Caution-**

o Be cautious when muscle testing an injured area as to not cause further damage. It is more important to discover the underlying dysfunction that lead to the presenting complaint.

o It is not always necessary to have the patient or client avoid the activities that caused the presenting problem for this might give them a false sense of being healed. It is often better to have them continue doing the things they love (a short break might be warranted) while focusing on fixing the underlying biomechanical fault.

• **S-I Stability Belt-** Patient will notice an improvement immediately if a stability belt is needed. Typically worn underneath clothing.

o If pelvic instability is suspected, retest the muscles of the core, trunk and lower extremities while the patient is wearing the S-I belt.

o Begin by wearing the belt every day, all day until the strengthening and stabilizing program is complete (4-6 weeks training the pelvic stabilizers such as gluteus medius and maximus), then have the patient only wear the belt while training or lifting. Always have the S-I belt available in case the symptoms return or begin to worsen.

Hour 6- Conditions 2

This course will cover:

How to use and interpret muscle testing in order to better diagnose and treat various musculoskeletal conditions of the shoulder and ankle. Dr. Scott Levine demonstrates how to perform and interpret functional tests that enable the practitioner to uncover instability of the shoulder and ankle that will often lead to musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities of shoulder and ankle that can lead or has lead to pathology. He or she will learn strength training and supportive modalities such as taping, bracing, and orthotics that will enable the viewer to better diagnose and treat musculoskeletal pathology and many common complaints throughout the body. Through muscle testing, the viewer will learn to uncover the cause of dysfunction leading to better care and achievement of long-term goals.

Hour 6 Outline:

- **Shoulder Instability-** Typically presents with A-C joint dysfunction. Begin by muscle testing Coracobrachialis, then move on to testing other muscles of the shoulder and upper extremity.
- **Coracobrachialis-** Arm Flexion
 - o Patient seated- Flex the arm to 90 degrees, fully flex the elbow, stabilize the back of the shoulder, contact the bicep and have the patient resist shoulder extension, compare bilaterally.
 - o Coracobrachialis will be weak in conjunction with AC joint instability. Taping and strengthening the anterior and posterior deltoids (isometric exercises) would aid in stabilizing this joint to allow for more proper function.
- **A-C joint instability-** (Acromio-clavicular joint) Typically caused by car accident, fall on outstretched arm, or a sudden pull to the arm.
 - o If a weakness is discovered, check for upper trapezius trigger points.
 - o If a trigger point is discovered, test for A-C joint instability by stabilizing the A-C joint (at the anterior superior shoulder on the weak side) with your hand and recheck the trigger point in the upper trapezius for tone and tenderness.
 - o Instability is indicated if the trigger point is alleviated and/or other extremity strength is increased by adding stability to the A-C joint.
- **Taping the shoulder-** Important in conjunction with strengthening when there is instability.
 - o Expose the shoulder and apply generous pressure by squeezing the top of the shoulder at the A-C joint in order to close the joint while the tape is applied.
 - o Apply tape from anterior to posterior over top of the shoulder and A-C joint.
 - o Anchor the tape laterally or perpendicular to the first piece of tape at both ends.
- **Ankle Instability-** Typically caused by trauma to the ankle such as rolling the ankle. The majority of lower ankle sprains have an associated upper ankle sprain. Begin by muscle testing the lower extremity.

- o Tibialis Anterior: Patient supine- Invert and dorsi-flex the foot while stabilizing above the ankle and contacting the pad of the foot, have the patient resist plantar flexion and eversion.
 - o Tibialis Posterior: Patient supine- Invert and plantar-flex the foot while stabilizing above the ankle and contacting the pad of the foot, have the patient resist dorsi-flexion and eversion.
 - o Paroneal Brevis and Longus: Patient supine- Evert and plantar-flex the foot while stabilizing above the ankle and contacting the pad of the foot, have the patient resist inversion.
 - o Paroneal Tertius: Patient supine- Evert and dorsi-flex the foot while stabilizing above the ankle and contacting the pad of the foot, have the patient resist inversion.
 - o If a weakness is discovered, check for tibialis posterior trigger points (upper calf) while the client or patient is lying supine.
 - o If a trigger point is discovered test for ankle instability by stabilizing below the knee and above the calf muscles and squeezing the tibia and fibula together with your hand before rechecking the trigger point in the tibialis posterior for tone and tenderness.
 - o Instability is indicated if the trigger point is alleviated and lower extremity strength is increased by adding stability to the tibia-fibula joint.
- **Bracing for ankle instability-** Should be done before standing up in the morning for the first time and should be worn all day for 6-8 weeks as rehab is taking place.
 - o After rising in the morning, sit at the edge of the bed and give the fibular head and tibia 3 firm squeezes to draw them together.
 - o Wrap tape or brace the tibia-fibula joint at the fibular head and do the same at the ankle before taking the first step in the morning. If bracing causes new discomfort, it is usually because it is too tight.
 - **Pronated Feet-** Often causes weakness or dysfunction in other areas of the body.
 - o Place an arch support under the suspected foot and recheck the shoulder strength and ranges of motion. If there is an improvement then trace the foot.
 - o To test for pronated feet, or to demonstrate the presence, trace the bare-foot while sitting (non-weight bearing) and redo the trace while standing without ever lifting the foot. The increase in width of the arch represents the arch-spread and the inability of the foot to maintain a healthy arch.
 - o Compare the left and right feet, a strong discrepancy might indicate instability in the foot and requires stabilization and strength training (towel-pulling and short-foot techniques, etc.). If this is ineffective, or the symptoms are severe enough, bracing or wrapping, possibly including orthotics or arch supports is indicated and should be worn for at least a year while stabilization training is taking place.

Hour 7- Principals of Muscle Testing

This course will cover:

The principals of how and why muscle testing works. Dr. Scott Levine reviews how to perform and interpret functional tests and describes the various causes of functional deficits. This course also teaches the viewer how properly differentiate and diagnose the fundamental cause of various musculoskeletal complaints.

Learning Objective:

By watching this hour viewers will review the fundamentals of muscle testing. He or she will learn how and why muscle testing can be used to better diagnose and treat musculoskeletal pathology. This course will cover the various laws and principals of physiology and function that is at the center of functional medicine. The viewer will learn patterns of dysfunction and the associated tests to properly diagnose and treat a patient or client's complaints.

Hour 7 Outline:

• Principals of muscle testing:

- o Use 2 hands, one for stabilizing, and the other for contacting (resisting).
- o Show the patient or client what the action is and have them resist that motion.
- o Compare one side to the other looking for weakness or signs of "cheating" which indicates a weakness. Checking quality and quantity of the movement.
- o The patient should be able to lock the joint as the resistance is applied.
- o Use proper form and posture to spare your body and to provide adequate leverage for proper resistance.
- o Wait for the patient or client to engage the muscle being tested before applying the resistance.
- o "Perfect practice makes perfect"
- o Avoid applying pressure on tender or injured areas.
- o Perform muscle tests from the bottom up, testing the muscles of the lower and upper extremities while lying supine, prone, sitting, and standing. Compare the major muscle groups side to side, front to back, and bottom to top in the various positions.

• Why muscle test?

- o Muscle testing helps in the diagnosis and development of the treatment plan. Use the patient history and exam findings in conjunction with the muscle test results to develop a treatment plan.
- o Muscle testing gives the practitioner insight into how the body is functioning at any given time. It uncovers old or hidden traumas and reveals areas that are more susceptible to injury if not corrected.

• Different causes of muscle weakness:

- o Nerve involvement (spine or peripheral entrapment)

- o Joint instability (strength increases when the joint is actively stabilized)
- o Inhibited muscles (Sherrington's law or reciprocal inhibition)

• **Quality and Quantity of the Muscle Contraction-**

- o Can he/she resist at all?
- o Can he/she resist throughout the range of motion?
- o Can he/she lock the joint against resistance?
- o Is the movement smooth?
- o Is the left or right weaker? (compare bilaterally, not to your strength)
- o Observe for signs of pain or cheating due to weakness.
- o Does the muscle fatigue over time?
- o Feel the muscle. Is it tender, tight, swollen, atrophied?

• **Anchor Muscle Weakness-** The muscles that are anchoring during the muscle exam have to be engaged just as much as the muscle being tested directly.

• **Disc vs. Facet Joint-** Test upper and lower extremity muscles bilaterally while seated.

- o Disc problems will cause weakness to be more pronounced when the patient or client is sitting with lumbar/ cervical flexion. (increases disc compression/pressure)
- o Facet joint problems will cause weakness to be more pronounced when the patient or client is sitting with lumbar/ cervical extension. (jams the facet joints)

Hour 8- Posture 1

This course will cover:

How to identify poor posture and develop an appropriate treatment plan to help various associated musculoskeletal and physiological complaints. Dr. Scott Levine teaches the causes, signs, symptoms, and long-term effects of poor posture. This course teaches the appropriate muscles to test and treat in the presence of a posture related dysfunction or complaint.

Learning Objective:

By watching this hour viewers will be able to detect functional abnormalities due to poor posture that can lead or has lead to pathology. He or she will better understand the causes and treatment of dysfunction allowing for better diagnoses and treatment of many common posture related complaints. Through muscle testing and postural evaluation, the viewer will learn to uncover the cause of dysfunction leading to better care and achievement of long-term goals.

Hour 8 Outline:

• **Poor Posture Epidemic-** Young and old alike are performing daily tasks such as texting or

typing improperly which causes forward head carriage, upper cross syndrome, carpal tunnel, and/or other posture related abnormalities that leads to chronic muscular imbalance and dysfunction.

- **Common causes of poor posture:**

- o Sleep position/ Stomach sleeping
- o Desk or Computer work
- o Texting/ Reading
- o Inadequate core strength/ Slouching
- o Stress- Related to sympathetic responses (fight or flight)
- o Carrying a purse- Raises shoulder and effects gait

- **Muscle imbalances associated with posture-** Janda's Upper and Lower Cross Syndromes

- **Upper-Cross Syndrome:**

- o Weak deep cervical flexors
- o Tight upper trap/ levator scapula
- o Weak lower trap/ serratus anterior
- o Tight SCM/ pectorals

- **Lower-Cross Syndrome:**

- o Weak abdominals
- o Tight thoraco-lumbar erectors
- o Weak gluteus medius and maximus
- o Tight rectus femoris/ iliopsoas

- **Poor posture will effect:** Give the patient or client a reason to correct their posture.

- o Physiology- 30% increase in vital lung capacity
- o ROM- Have patient or client demonstrate ROM while in poor vs. correct posture
- o Strength- Test muscle strength with poor vs. correct posture
- o Emotions- Poor posture often mimics the body language of depression
- o Increases risk of injury and chronic degeneration
- o Impairs memory- Forward head posture reduces CSF and blood flow to the brain. Less movement equals less stimulation.

- **Upper-Cross muscle testing:**

- o **Deep cervical flexors (weak)-** Take caution with testing the neck as to not cause

injury. We assume that with forward head posture comes weak deep neck flexors.

- o **Serratus anterior (weak)**- Pull shoulders back allowing chest to rise. Standing, have the patient or client flex shoulder forward with arm fully internally rotated and scapula protracted, stabilize shoulder blade and contact forearm as they resist shoulder extension.

- o **Lower trap. (Weak)**- Prone, arms forward overhead off the table and internally rotated, stabilize shoulder blade and contact forearm as they resist shoulder extension. Multiple fibers so test in a few planes drawing a line down arm to specify what fiber is being tested.

- **Postural muscles prone to tightness/ shortness:** Must be stretched

- o Gastroc/ Soleus- Soleus is more related to posture

- o Tibialis Posterior- Related to the arches of the foot

- o Hip Adductors- Tightness can cause a shortened gait (hip turned out)

- o Hamstrings- Associated with lower back pain and dysfunction

- o Rectus Femoris- Associated with lower back pain and dysfunction

- o Iliopsoas- Effects the curve of the lower back and is associated with LBP (sitting to standing)

- o TFL- Tight due to gluteus maximus weakness

- o Piriformis- Related to sciatica (wallet)

- o Thoraco-lumbar Extensors- Keep torso from falling forward

- o Quadratus Lumborum- One of the most chronically overworked and tight muscles (prone to trigger points and causes LBP)

- o Pectoralis Major- Multiple fibers (fan)

- o Upper Traps- Stress and breathing improperly

- o Levator Scapulae- Tight because opposing muscles are weak (associated with headaches)

- o Scalenes- Associated with headaches

- o SCM- Over-contraction causes head to tilt over and down

Hour 9- Principals of Exercise Prescription

This course will cover:

How to identify the common patterns of dysfunction associated with poor posture and develop an appropriate treatment plan including the proper exercise prescription. Dr. Scott Levine teaches the muscles that are prone to tightness and the ones that are prone to weakness along with the principals of exercise prescription. This course teaches the appropriate muscles to test

and treat in the presence of a posture related dysfunction or complaint.

Learning Objective:

By watching this hour viewers will learn the practical application of muscle testing and be able to detect functional abnormalities due to poor posture that can lead or has lead to pathology. He or she will better understand the causes and treatment of posture related dysfunction. Through muscle testing and postural evaluation, the viewer will learn to uncover the cause of dysfunction leading to better care and achievement of long-term goals.

Hour 9 Outline:

• Phasic muscles prone to weakness/ inhibition: Must be strengthened

- o Rectus Abdominus- When strengthening this muscle maintain the curve in the lumbar spine, perform the McGill curl-up which is basically a sit-up with the hands under the lumbar spine. Perform until the patient or client is unable to maintain the curve in the lumbar spine.

- o Serratus Anterior and Rhomboids- Help open up the shoulders, weakness causes the shoulders to roll forward.

- o Lower Trapezius- Pulls shoulders back and reciprocal inhibition turns off the upper traps.

- o Deep Neck Flexors- Take caution with testing the neck as to not cause injury. We assume that with forward head posture comes weak deep neck flexors. Chin-tuck with theraband exercise or forward planks with chin tucked will help strengthen this area.

• Principals of Exercise Prescription-

- o Inspire and educate them on why they need to do the exercises.

- o Progressive exercises (continued re-evaluations)- Increase weight/ tension, single arm holding weight, single leg/ single arm stability= increase labile surface, 3 dimensional movements.

- o Strengthen weak muscles and Stretch tight muscles- Test the muscles to determine (imbalance) which are weak and contributing the complaint, poor function or poor posture.

- o Give proper instruction- Ensures that the right muscles are being strengthened, avoids injury or cheating, ensures proper form and success. Put them into the proper positions and the improper positions to show them what they should do and what they will do and should avoid when they start to fatigue.

- o Know when to stop- Stop at broken form and fatigue, not based on the number of reps.

- o Posture exercises and positions should be performed daily.

- o Give at most 4 exercises- This ensures that they will be done, and done correctly. When they are done correctly they will at least get some results and can progress from there.

- o Make the exercises interesting- Functional exercises
- o Keep them accountable- Allows for more motivation and success.
- o Muscle Activation: 3 types- static, dynamic, and labile.
- o Start with the core- Need stability in the core before you can have proper movement in the extremities.

• **Practical Application-**

- o Obtain a full history going back as far as possible.
- o Test all the muscles of the core, upper, and lower extremities. Test upper and lower while supine, then prone, then sitting and standing.
- o Evaluate for possible orthotics.
- o Find the weak muscles and the beginning of the problem in the biomechanical chain.
- o Palpate the muscles for tone, tenderness, and atrophy.
- o Evaluate balance.
- o Make the patient aware of the problems and dysfunction and motivate them to fix it.
- o Start with the core, strengthen weak muscles and stretch tight muscles giving no more than 4 exercises (postural exercises should be done daily).
- o Re-evaluate periodically to allow for adequate progression. Hold them accountable.

